

## Numerical solution of the viscous flows in a network of thin tubes: equations on the graph

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A non-stationary flow in a network of thin tubes is considered. Its one-dimensional approximation was proposed in a paper by G.Panasenko and K.Pileckas [1]. It consists of a set of equations with weakly singular kernels, on a graph, for the macroscopic pressure. A new difference scheme for this problem is proposed. Several variants are discussed. Stability and convergence are studied theoretically and numerically. Numerical results are compared to the direct numerical solution of the full dimension Navier-Stokes equations.

More details about the kernels will be discussed in the talk by Éric Canon: On weakly singular kernels arising in equations set on a graph, modelling a flow in a network of thin tubes.

### References

1. Panasenko G.P., Pileckas K., Flows in a tube structure: equation on the graph, *Journal of Mathematical Physics*, **Vol** 55: 081505, 2014.